XVI.

REMARKS ON THE BRAIN,

ILLUSTRATED BY THE DESCRIPTION OF THE BRAIN OF A DISTINGUISHED MAN.

By Thomas Dwight, M.D.,

Late Professor of Anatomy at the Medical School of Maine.

Read Dec. 12, 1877.

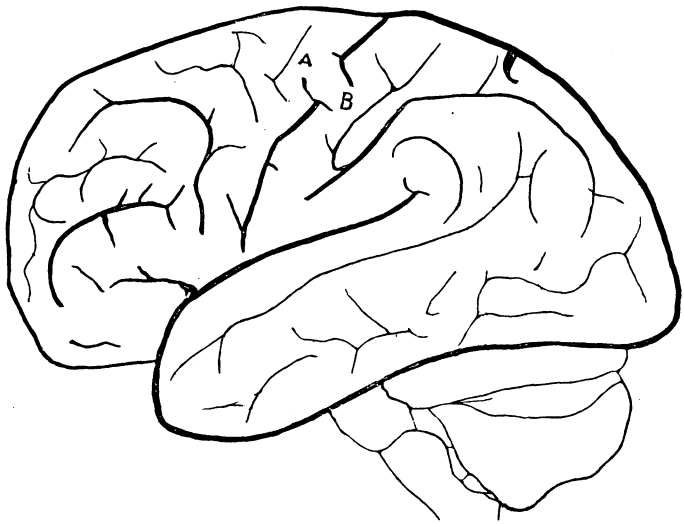
The objects of this paper are: first, to describe the brain of a distinguished man, for in the present state of knowledge, when we are ignorant to what extent purely anatomical appearance may be of psychological or physiological significance, the observation of the brains of known individuals is doubly important; secondly, to call attention to an extremely rare anomaly of the convolutions; and, lastly, to present a few observations on the extent of our knowledge of the brain.

The late Mr. Chauncey Wright, whose brain is the one to be described, died in the prime of life. He was a man of very varied acquirements, a proficient in physics and mathematics, and was what may be called a general critic. He was considered an instance of very exceptional mental power. He was of rather large frame, with a large head and a high forehead.

The brain weighed 53½ oz. avds. The most striking point in the shape is the height in the frontal region and the sharpness of the curve where the upper surface passes into the anterior one. In most brains the two ends are in this respect nearly symmetrical, but in this one the difference is very marked. The convolutions are large and plump, with deep fissures between them; but the small, irregular fissures, that give many brains a very complicated appearance, are comparatively few except in the frontal region. The two sides are as symmetrical as are often observed, the chief difference between them being the somewhat greater complexity of the left frontal lobes.

The frontal convolutions are the most complex. On each side, the first one arises by two roots from the anterior central convolution.

The second is crowded outward, and arises in common with the third. The first is a good deal cut up by secondary fissures. The under surface of the frontal lobe is very simple, especially on the right side. In



This drawing, though made from the brain, is meant rather as a diagram than as an accurate representation. The letters A and B are placed respectively on the anterior and posterior central convolutions. The anomalous bridge is between them.

the parietal region, the superior parietal lobe (of Ecker, the præcuneus of Bischoff), is perhaps uncommonly large. On the left side, it sends a narrow prolongation far down behind the posterior central convolution. The arrangement of the convolutions turning round the fissure of Silvius and running to the apex of the temporal lobe is remarkably simple, though, according to Bischoff, this part is usually complicated in European (*i.e.*, Caucasian) brains: the one in question is in this respect even simpler than that of the "Hottentot Venus." There is nothing important to record concerning the occipital lobe. The median surface may be briefly discussed. The right *fissura callosomarginalis* is interrupted by a bridge on the upper part of its course. The occurrence of a bridge is not uncommon, but usually it is placed lower down in front of the *corpus callosum*. This fissure, after turning up behind the posterior central convolution, runs a considerable distance into the præcuneus, farther on the right than on the left.

Few of these points are of much consequence. We might dismiss the brain with the statement that the frontal region is largely developed and complicated and the rest simple, were it not for the very rare anomaly about to be described. This is a small gyrus uniting the two central convolutions by dividing the fissure of Rolando. It occurs on both sides of the brain. On the left, it is situated about one inch from the median fissure, and runs obliquely forward and upward from the posterior to the anterior central convolution. It is superficial throughout and absolutely unmistakable. On the right, it is much less easily recognized: for, though superficial, it is very near to the median fissure, and at first suggests simply a somewhat premature ending of the fissure of Rolando; but a glance at the inner side of the hemisphere shows that this view is not tenable, — that there is actually a bridge, and that the fissure is even a little longer than usual. The termination of the calloso-marginal fissure is a useful guide in studying these relations. When the writer examined this brain, there was but one case of this anomaly on record; and this, curiously enough, was in the brain of a known man, that of Dr. Fuchs, of Göttingen, which is described by Wagner.* "Both [*i.e.*, the central convolutions] are connected with one another by bridges, of which, especially on the left side, a very considerable one arises, with a broad root, from the anterior central convolution." It will be seen by consulting Wagner's plates that the gyrus on the left side of Fuchs's brain is very similar to the one described in this paper. Bischoff† refers to Wagner's statement in a tone approaching that of unbelief. He writes: "These two convolutions [the central ones] have always two communications around the ends of the fissure, bordering on the great median fissure and on the Sylvian fossa, but *never* in their course. It is very striking that R. Wagner should describe and figure such a communication between both central convolutions on the brain of Professor Fuchs, as if it were something of frequent occurrence. In the many brains that I have examined, I never saw any thing of the kind." And, again, Bischoff, speaking in another place of the same fissure, says, "Which [the fissure] is distinguished from all other fissures by its early appearance, its unchanged direction and structure, and the fact it is never interrupted by any convolution, and only very gradually inclines rather more backward." And again, in discussing this fissure in apes, "Its course in apes also is

* Vorstudien zu einer wissenschaftlichen Morphologie und Physiologie des menschlichen Gehirns als Seelenorgan. 1860–62.

† Die Grosshirnwindungen des Menschen. 1868.

never interrupted." Ecker* states that the fissure "is never or extremely seldom bridged over in its course by a secondary convolution," and in a foot-note mentions that such an occurrence has never been observed by Turner or Bischoff. The next to report similar cases is Féré,† who has seen two; in one of them, however, the bridge is situated much lower, and, for reasons to be given later, should perhaps be excluded from this class. We give his brief account in his own words: "Le sillon de Rolando peut être interrompu aussi par des plis de passage. Nous avons vu deux cerveaux sur lesquels les deux circonvolutions ascendantes étaient réunis par un pli de passage aussi saillant qu'elles et absolument continu. Sur l'un ce pli était situé à l'union du tiers inférieur avec les deux tiers supérieurs du sillon de Rolando. Sur l'autre il était situé vers la partie moyenne, de sorte qu'il formait avec les deux circonvolutions ascendantes une *H* inclinée en arrière. (Ces deux sujets n'avaient présenté aucun trouble intellectuel.)" Very recently, Heschl,‡ of Vienna, comes on the field with a preliminary paper, announcing some of the results of the examination of 1,087 brains, 632 of which were from male bodies, and 455 from female. In these he has seen the anomaly six times: three times on the right and twice on the left in male brains, and once on the left in a female one. Heschl has the merit of being the first to explain the occurrence of this phenomenon. With the exception of one of Féré's cases, the bridge was always near the upper end of the fissure of Rolando; and Heschl has observed that at about the junction of the middle and upper thirds of the fissure there is very frequently a transverse gyrus in its depths, which is not visible till the central convolutions are pulled apart. He has found this in his 1,087 brains, when it reached only from one-sixth to one-third of the way to the surface, 75 times; when it reached from one-third to five-sixths of that distance, 67 times; and, as already stated, six times when it was on a level with the surface. Since reading Heschl's paper, the writer has examined a number of brains, and has found several instances of a deep gyrus in this situation. It seems difficult to deny the force of Heschl's argument, that these rare anomalies are instances of uncommon development of this fold.

This, then, is an anatomical fact of considerable curiosity, that de-

---

* The Cerebral Convolutions of Man. 1869.

† Note sur Quelques Points de la Topographie du Cerveau, par Ch. Féré. Archives de Physiologie Normale et Pathologique. Paris, 1876.

‡ Wiener Medizinische Wochenschrift, Oct. 13, 1877.

serves to be recorded; but the question presents itself, What is its significance and importance? which introduces necessarily the larger question, What is the significance of the convolutions? It has long been believed that the weight of the brain, and the complexity of the convolutions, are in direct ratio to the intellectual power of the individual; but of late statistics have gone far to overthrow the former of these doctrines, and to weaken belief in the latter. The series of weights of nearly a thousand brains tabulated by Wagner, and the list of weights of well-known men given by Flint, seem to show that weight is of but little importance; and the theory of the convolutions rests chiefly on the fact that the brains of idiots are but slightly developed. Certain is it that we have not the data to establish the theory.

A difficulty, however, which has, we think, been very much overlooked, but which nevertheless lies at the root of the whole matter, is that we are dealing with words that convey no definite idea. We say that a heavy brain accompanies intellect, intelligence, a gifted mind, but have merely the vaguest idea what we mean by it. Almost if not quite all truly distinguished men are noted for their ability in some special direction, often counterbalanced by marked weaknesses in others. The ability of the mathematician, the musical composer, the novelist, the politician, the actor, the strategist is in each case different, and we are not certain in which it is the highest. We are also ignorant, in spite of the labor expended on the subject, how much the size of the brain depends on that of the body, and whether active muscular exercise, which enlarges the muscles, may not, *pari passu*, enlarge the central nervous organs. Another point to be considered is the effect of opportunity, not only in making merit known, but, what is far more important, in developing it. This question, indeed, is of primary importance: for if it be true that the brain has very nearly reached its anatomical perfection at the age of eight years, and increases but slightly up to twenty, and but very slightly subsequently (Marshall), and if it be true that its shape or size is any index of the mind, it must be an index of the mind in the rough, or, to speak more accurately, of its possibilities; for it certainly has not gained its full strength at twenty. Bad habits or want of education may not only prevent an originally good mind from doing itself justice, but may make it incapable of even ordinarily good work; yet there is no reason to suppose that the weight or outline of the brain would be modified.

Mr. W.'s brain can hardly be quoted in support of existing theories. If the general estimate of his abilities be just, — as we believe it is, —

and if weight of brain be any criterion of mental power, we certainly should expect one of greater weight than 53½ oz. In the same way, we are surprised to find the great simplicity of a part (the parieto-temporal region) which we are told is usually complicated in European races. According to Wagner, a complicated — which with him is synonymous with a highly-developed — brain is of the same nature throughout; but here is a marked exception to the rule, if rule it be. Comparing this brain to some of known men figured by Wagner, we have little hesitation in declaring it decidedly more simple than those of Gauss and Derichlet, mathematicians, and Fuchs, a physician; rather more simple than that of Hermann, a philologist, and much in the style of that of a celebrated naturalist, whose name is not given.

It must, of course, be admitted that a certain amount of cerebral matter is necessary to make a man more than an idiot; but, this being granted, we think that in consequence of our uncertainty of what mental elements constitute what is vaguely called a great mind; in consequence of our ignorance of many qualities of any given mind, of the opportunities of any given individual, and the various influences which must obscure our knowledge of his real character; in consequence of the apparently contradictory results of statistics of the weight of brains, and of our ignorance of how much that depends on the weight of the body; in consequence, finally, of the unsatisfactory results of the examination of the convolutions, — we must admit that as yet we have no proof of any definite relation between the weight and shape of the brain on the one hand and the mental capacity on the other.